CLAIMS

1.   (Currently amended) An image pickup system comprising:

noise estimating means for estimating ~~the~~ an amount of noise contained in a digitized signal from an image pickup element composed of an array of a plurality of pixels, either for each pixel or for each specified unit area comprising a plurality of pixels;

shooting ~~situation~~ condition estimating means for estimating ~~the~~ a shooting ~~situation~~ condition when an image based on ~~the~~ said signal is acquired;

correction means for correcting the amount of noise estimated by the noise estimating means based on ~~the basis of~~ the shooting ~~situation~~ condition estimated by the shooting ~~situation~~ condition estimating means; and

noise reducing means for reducing the noise in the signal based on ~~the basis of~~ the amount of noise corrected by the correction means.

2.   (Currently amended) The image pickup system according to claim 1, further comprising:

color filters ~~that are~~ arranged on ~~the~~ a front surface of the image pickup element; and

separating means for separating the signal that is output from the image pickup element into signals for each color filter.

3.   (Currently amended) The image pickup system according to claim 2, wherein the noise estimating means comprises:

parameter calculating means for calculating parameters based on ~~the basis of~~ at least one type of information selected from among ~~the~~ a signal value level of the signal, ~~the~~ a temperature of the image pickup element, ~~the~~ a gain for the

signal, and ~~the~~ a shutter speed during shooting; and

noise amount calculating means for calculating the amount of noise based on ~~the basis of~~ the parameters calculated by the parameter calculating means.

4.   (Currently amended) The image pickup system according to claim 2, wherein the shooting ~~situation~~ condition estimating means comprises at least ~~either~~ one of overall estimating means for estimating the shooting ~~situation~~ condition for ~~the~~ an overall signal when an image based on the signal is acquired, ~~or~~ and regional estimating means for estimating the shooting ~~situation~~ condition for each region when an image based on the signal is acquired.

5.   (Currently amended) The image pickup system according to claim 2, wherein the shooting ~~situation~~ condition estimating means has overall estimating means for estimating the shooting ~~situation~~ condition for ~~the~~ an overall signal when an image base on the signal is acquired, based on ~~the basis of~~ at least one type of information selected from among focus information, exposure information, zoom position information, eye sensing information and strobe light emission information.

6.   (Currently amended) The image pickup system according to claim 2, wherein the shooting ~~situation~~ condition estimating means comprises:

focusing position estimating means for estimating, based on ~~the~~ focus information, to which shooting ~~the~~ a focusing position belongs among three or more types of shooting at least including scenery shooting, portrait shooting and close-up shooting;

shooting-subject distribution estimating means for estimating, based

on ~~the~~ exposure information, to which shooting the shooting-subject distribution belongs among three or more types of shooting <u>including</u> at least ~~including~~ <u>an</u> overall signal, central emphasis or central portion; and

overall estimating means for estimating the shooting situation relating to ~~the~~ <u>an</u> overall signal when an image based on the signal is acquired, by combining the focusing position estimated by the focusing position estimating means and the shooting-subject distribution estimated by the shooting-subject distribution estimating means.

7.　　(Currently amended)　The image pickup system according to claim 2, wherein the shooting ~~situation~~ <u>condition</u> estimating means comprises overall estimating means for estimating and judging, <u>based</u> on ~~the basis of~~ exposure information, whether or not the shooting ~~situation~~ <u>condition</u> relating to ~~the~~ <u>an</u> overall signal when an image based on the signal is acquired is of night view shooting.

8.　　(Currently amended)　The image pickup system according to claim 2, wherein the shooting ~~situation~~ <u>condition</u> estimating means comprises:

image characteristic detection means for detecting, <u>based</u> on ~~the basis~~ ~~of~~ the signal, ~~the~~ characteristics of the image based on the signal; and

regional estimating means for estimating the shooting ~~situation~~ <u>condition</u> of respective regions when an image based on the signal is acquired, <u>based</u> on ~~the basis of~~ the image characteristics detected by the image characteristic detection means.

9.　　(Currently amended)　The image pickup system according to claim 8,

wherein the image characteristic detection means comprises at least one type of means selected from among specific color detection means for detecting specific color regions as image characteristics from the signal, specific brightness detection means for detecting specific brightness regions as image characteristics from the signal, and frequency detection means for determining frequency information in local regions of a specified size as image characteristics from the signal.

10. (Currently amended) The image pickup system according to claim 8, wherein the image status estimating means further comprises down sampling means for down sampling the signal, and the image characteristic detection means detects the image characteristics of the image based on the basis of the signal down sampled by the down sampling means.

11. (Currently amended) The image pickup system according to claim 2, wherein the noise reducing means comprises:

threshold value setting means for setting the an amplitude value of the noise as a threshold value based on the basis of the amount of noise corrected by the correction means, either for one of each pixel, or for and each specified unit area comprising a plurality of pixels; and

smoothing means for reducing the amplitude components in the signal that are equal to or less than the threshold value set by the threshold value setting means.

12. (Currently amended) The image pickup system according to claim 3, wherein the noise amount calculating means is comprises means that calculates the an amount of noise N using the a signal value level L of the signal, the a

temperature T of the image pickup element, ~~the~~ a gain G for the signal and ~~the~~ a shutter speed S during shooting as parameters, and comprises:

coefficient calculating means for calculating four coefficients A, B, C and D based on ~~the basis of~~ three functions a(T, G), b(T, G) and c(T, G) using the temperature T and gain G as parameters, and a function d(S) using the shutter speed S as a parameter; and

function calculating means for calculating the amount of noise N where: ~~on the basis of a functional formula~~

$$N = (AL^B + C)D$$

defined by the four coefficients A, B, C and D calculated by the coefficient calculating means.

13.   (Currently amended) The image pickup system according to claim 12, wherein the noise amount calculating means further comprises assigning means for assigning standard parameter values, and the parameters are <u>one of</u> values calculated by the parameter calculating means, ~~or~~ <u>and</u> standard values assigned by the assigning means.

14.   (Currently amended) The image pickup system according to claim 3, wherein the noise amount calculating means comprises:

assigning means for assigning standard values as standard parameter values for parameters not obtained from the parameter calculating means; and

look-up table means for determining the amount of noise by inputting the signal value level, temperature, gain and shutter speed obtained from <u>one of</u> the parameter calculating means ~~or~~ <u>and</u> the assigning means.

15. (Currently amended) The image pickup system according to claim 1, wherein the noise estimating means comprises:

parameter calculating means for calculating parameters based on ~~the basis of~~ at least one type of information selected from among ~~the~~ a signal value level of the signal, ~~the~~ a temperature of the image pickup element, ~~the~~ a gain for the signal and ~~the~~ a shutter speed during shooting; and

noise amount calculating means for calculating the amount of noise based on ~~the basis of~~ the parameters calculated by the parameter calculating means.

16. (Currently amended) The image pickup system according to claim 1, wherein the shooting ~~situation~~ condition estimating means ~~comprise~~ comprises at least ~~either~~ one of overall estimating means for estimating the shooting ~~situation~~ condition for ~~the~~ an overall signal when an image based on the signal is acquired, ~~or~~ and regional estimating means for estimating the shooting situation for each region when an image based on the signal is acquired.

17. (Currently amended) The image pickup system according to claim 1, wherein the shooting ~~situation~~ condition estimating means has overall estimating means for estimating the shooting ~~situation~~ condition for ~~the~~ an overall signal when an image base on the signal is acquired, based on ~~the basis of~~ at least one type of information selected from among focus information, exposure information, zoom position information, eye sensing information and strobe light emission information.

18. (Currently amended) The image pickup system according to claim 1, wherein the shooting ~~situation~~ condition estimating means comprises:

focusing position estimating means for estimating, based on ~~the~~ a focus information, to which shooting the focusing position belongs among three or more types of shooting ~~at least~~ including <u>at least</u> scenery shooting, portrait shooting and close-up shooting;

shooting-subject distribution estimating means for estimating, based on ~~the~~ exposure information, to which shooting the shooting-subject distribution belongs <u>from</u> among three or more types of imaging <u>including</u> at least ~~including~~ <u>an</u> overall signal, central emphasis or central portion; and

overall estimating means for estimating the shooting situation relating to the overall signal when an image based on the signal is acquired, by combining the focusing position estimated by the focusing position estimating means and the shooting-subject distribution estimated by the shooting-subject distribution estimating means.

19.   (Currently amended) The image pickup system according to claim 1, wherein the shooting ~~situation~~ <u>condition</u> estimating means comprises overall estimating means for estimating and judging, <u>based</u> on ~~the basis of~~ exposure information, whether or not the shooting ~~situation~~ <u>condition</u> relating to ~~the~~ <u>an</u> overall signal when an image based on the signal is acquired is night view shooting.

20.   (Currently amended) The image pickup system according to claim 1, wherein the shooting ~~situation~~ <u>condition</u> estimating means comprises:

image characteristic detection means for detecting, <u>based</u> on ~~the basis of~~ the signal, ~~the~~ characteristics of the image based on the signal; and

regional estimating means for estimating the shooting situation of respective regions when an image based on the signal is acquired, <u>based</u> on ~~the~~

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~~basis of~~ the image characteristics detected by the image characteristic detection means.

21. (Currently amended) The image pickup system according to claim 20, wherein the image characteristic detection means comprises at least one type of means selected <u>from</u> among specific color detection means for detecting specific color regions as image characteristics from the signal, specific brightness detection means for detecting specific brightness regions as image characteristics from the signal, and frequency detection means for determining frequency information in local regions of a specified size as image characteristics from the signal.

22. (Currently amended) The image pickup system according to claim 20, wherein the image status estimating means further comprises down sampling means for down sampling the signal, and the image characteristic detection means detects the image characteristics of the image <u>based</u> on ~~the basis of~~ the signal down sampled by the down sampling means.

23. (Currently amended) The image pickup system according to claim 1, wherein the noise reducing means comprises:

threshold value setting means for setting ~~the~~ <u>an</u> amplitude value of the noise as a threshold value <u>based</u> on ~~the basis of the~~ <u>an</u> amount of noise corrected by the correction means, ~~either~~ for <u>one of</u> each pixel, ~~or~~ <u>and</u> for each specified unit area comprising a plurality of pixels; and

smoothing means for reducing ~~the~~ amplitude components in the signal that are equal to or less than the threshold value set by the threshold value setting means.

24.   (Currently amended) The image pickup system according to claim 15, wherein the noise amount calculating means is means that calculates the amount of noise N using the signal value level L of the signal, the temperature T of the image pickup element, the gain G for the signal and the shutter speed S during shooting as parameters, and comprise:

coefficient calculating means for calculating four coefficients A, B, C and D based on ~~the basis of~~ three functions a(T, G), b(T, G) and c(T, G) using the temperature T and gain G as parameters, and a function d(S) using the shutter speed S as a parameter; and

function calculating means for calculating the amount of noise N where: ~~on the basis of a functional formula~~

$$N = (AL^B + C)D$$

defined by the four coefficients A, B, C and D calculated by the coefficient calculating means.

25.   (Currently amended) The image pickup system according to claim 24, wherein the noise amount calculating means further comprises assigning means for assigning standard parameter values, and the parameters are values calculated by one of the parameter calculating means, ~~or~~ and standard values assigned by the assigning means.

26.   (Currently amended) The image pickup system according to claim 15, wherein the noise amount calculating means comprises:

assigning means for assigning standard values as standard parameter values for parameters not obtained from the parameter calculating means; and

look-up table means for determining the amount of noise by inputting the signal value level, temperature, gain and shutter speed obtained from <u>one of</u> the parameter calculating means ~~or~~ <u>and</u> the assigning means.

27.   (Currently amended)   An image processing ~~programs~~ <u>program</u> comprising:

a noise estimating routine for estimating the amount of noise contained in digitized signals from an image pickup element composed of an array of a plurality of pixels, ~~either~~ for <u>one of</u> each pixel ~~or~~ <u>and</u> for each specified unit area comprising a plurality of pixels;

a shooting ~~situation~~ <u>condition</u> estimating routine for estimating ~~the~~ <u>a</u> shooting ~~situation~~ <u>condition</u> when an image based on the signal is acquired;

a correction routine for correcting ~~the~~ <u>an</u> amount of noise estimated by the noise estimating routine <u>based</u> on ~~the basis of~~ the shooting ~~situation~~ <u>condition</u> estimated by the shooting ~~situation~~ <u>condition</u> estimating routine; and

a noise reducing routine for reducing the noise in the signal <u>based</u> on ~~the basis of the~~ <u>an</u> amount of noise corrected by the correction routine.